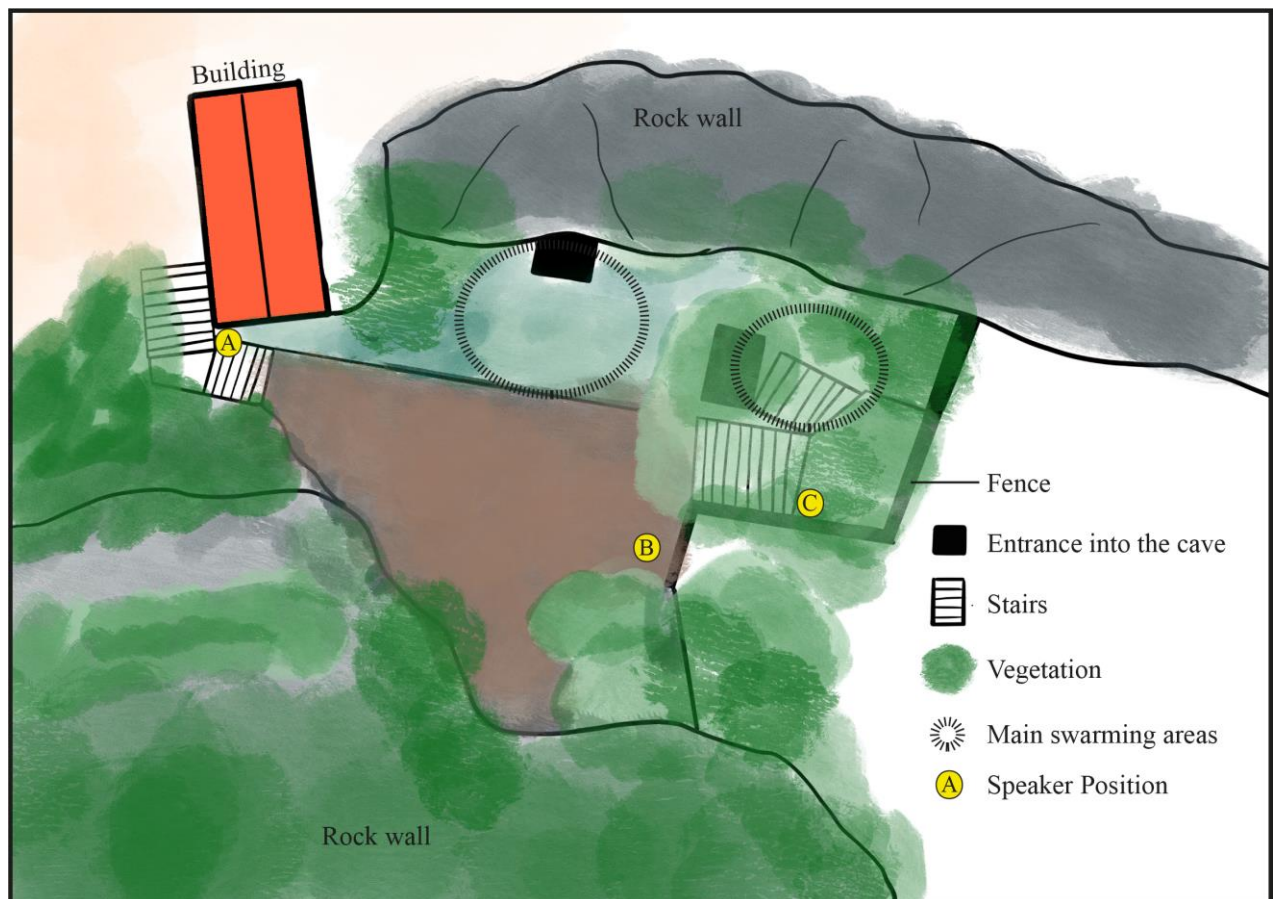


Supplementary Material

Supplementary Video 1. Video of swarming bats in front of one of the two entrances of the Kalkberg cave filmed with a thermal camera (FLIR E95, Teledyne FLIR LLC, Wilsonville, USA).

Supplementary Audio 1. Audio files of the social call recordings shown in Figure 3.



Supplementary Figure 1. Locations of playback experiments in the vicinity of the swarming areas. The speaker was mounted on a tripod directing upwards at playback location B and C and hanging from a wall, directing forward at location A. Bats swarmed above the low vegetation in the swarming area on the left, while larger trees covered the swarming area on the right.

Supplementary Table 1. Classification of observed call types in former publications and information whether the respective call types were recorded by Wimmer and Kugelschafter (2015) from free ranging bats identified via a photo trap. The last columns indicates whether the respective call type was assigned to both species in our analysis of surrounding echolocation call snippets.

Call type	Pfalzer and Kusch 2003	Schmidbauer and Denzinger 2019	Wimmer and Kugelschafter 2015		Classified to both species in our analysis
			<i>M. daubentonii</i>	<i>M. nattereri</i>	
Squawks	A (squawk)	(E) Squawk with noisy signal	X		X
Modulated FM downsweep	C (curved or cheep)	(A) Short cheep-like call with steep frequency modulation and shallowly modulated middle part			
FM downsweep	C (curved or cheep)		X	X	
L-shape	C (curved or cheep)		X		X
U-shape	C (curved or cheep)				X
UI-shape		(B) Two element call with an upward hooked element followed by a steep frequency modulated (FM) element			
Inverted N-shape	D (complex or song)	(C) Fast modulated call with by a rapid downward-upward-downward frequency modulation		X	X
Hook					
Hook of lower frequency	C (curved or cheep)		X	X	
FM pulses	B (repeated or trill)	(F) Churring-like call consisting of short FM pulses	X	X	X
Variable tonal	D (complex or song)	(D) Long broadband trill	X	X	